REMARKS

The rejection of Claims 1-8, 13-23 under 35 USC 112, first paragraph, for failing to satisfy the enabling and description requirements is retained, in view of the teachings of Van Lierop et al (Immunology 1995).

With regard to the enablement rejection, the Examiner, contends that:

> "In contrast to applicant's arguments, the evidence provided in the previously cited reference of Van Lierop et al (Immunology 1995) clearly shows that three FMDV peptides tested were not recognized by DH24A halotypes. The influence of MHC polymorphism may be less apparent in response to whole viral proteins. The effect of MHC polymorphism should not be underestimated when testing new subunit vaccines in randomly chosen groups of animals. In order to establish the efficacy of the vaccine in different MHC backgrounds the animals should be typed in advance. In order to design a peptide vaccine, which is effective in all animals, the response to different T-cell epitopes should be tested for all possible MHC haplotypes (see page 84, especially last paragraph)." (Delineation is Applicants' for emphasis)

The Examiner therefore surmised that:

> "According to the Van Lierop et al reference peptide vaccines in general and specifically FMDV, contemplated in the instant invention, are not predictable and must be experimentally determined. Therefore, the rejection is maintained ... ."

The rejection based on failure to meet the description requirement is based on the grounds that:

> "Based on the objective evidence that there is a need to test each peptide for efficacy as a vaccines formulation as indicated in the reference of Van Lierop et al. (immunology 1995) it is clear that the instant specification does not provide the requisite written description for a FMDV peptide based vaccine."

Applicants traverse the rejections because the record lacks substantial evidence, which would support the contention that Van Lierop et al's recommendation of typing animals of different backgrounds in designing peptide vaccines constitutes a requirement for determining efficacy of vaccines. Assuming arguendo that said recommendation constitutes a requirement for determining efficacy, the evidence that three FMDV peptides tested were not recognized by DH24A halotypes constitutes 3% non-responsiveness based on 600 animals tested.

One would hardly argue that such a percent of non-responsiveness makes the vaccines non-efficacious.

Hence the issue here is whether Van Lierop et al's results of 3% non-responsiveness or recommendation of typing all animals of different backgrounds in designing peptide vaccines rebuts the presumption of enablement or description of the claimed vaccines. Applicants do not believe so. To the contrary, Van Lierop et al's findings with regard to the influence MHC polymorphism concur with Applicants disclosure.

It is well settled in the law that a patent specification is presumed to be enabling if it contains a teaching of a manner and process of making and using the invention in terms, which corresponds in scope to those used in defining the claimed subject matter. It is enabling whether it sets forth that teaching by the use of illustrative examples or broad terminology. To overcome the presumption, the Examiner must set forth reasons to doubt the objective truth of the statement contained therein. The Examiner may point out that the statement, on its face, is contrary to generally accepted scientific principles, or the Examiner may make reference to a pertinent reference, which contradicts the applicant. The invention is presumed to be sufficiently described wherein the claims find support in the specification.

In this case, the pertinent reference, Van Lierop et al fails to rebut the presumption by showing that 3% of animals of a certain typing were non-responsive to certain peptide vaccines. In this regard, Applicants direct the Examiner's attention to Van Lierop et al at page 84, column 1, last paragraph which states that:

> "Complete non-responsiveness to the three FMDV peptides was observed for the DH24A haplotype. Seventeen animals in the typed WAU herd were found to be homozygous for DRB3*24, a DRB3 type which is found to occur exclusively in the DH24A haplotype. Thus only 3% of non-responders from the total herd of 600 animals would be expected, on the basis of the frequency of the DH24A haplotype."

Surely, the Examiner would agree that 3% non-responsiveness is not a basis for concluding that a vaccine is not efficacious.

With regard to the suggested requirement for typing all animals, it seems that Van Lierop et al recommends such typing in order to establish vaccine efficacy in animals of different backgrounds. This enables one to select animals in which the most frequent MHC class II types are represented and equally distributed. See the last paragraph of Van Lierop et al.

Nonetheless, Van Lierop et al acknowledges that one can predict the outcome of response in one class based on the typing of another class. In this regard, Applicants direct the Examiner's attention to Van Lierop et al, in the first paragraph, column 2, at page 84, which notes that:

> "Knowledge of the precise restriction element is not necessarily essential for the prediction of the effectiveness of a peptide in a MHC-typed animal. Cross-overs between the different MHC class II loci appear to be limited, leading to a strong linkage between DR, DQ and probably also other products. 34, 35. Thus, in general, typing for only one MHC class II product might be sufficient to predict the outcome of the response towards a peptide. ..." (Delineation is Applicants')

Finally, Applicants direct the Examiner's attention to the last sentence of page 84 of Van Lierop et al, suggesting that certain peptide can circumvent MHC restrictions. To be sure, because of the unpredictability of living processes, generic microbiological claims may cover inoperative members of the class. This is not fatal to the claims if a majority of the members of the class are operative, Ex parte Geer, 3 USPQ 131 (Patent Office Bd. App. 1929); if a person skilled in the art would recognize which species are operative and which are not, In re Sarett 140 USPQ 474 (CCPA 1964).

From the foregoing, it would seem that even if one were to adopt the Examiner's standard of typing all animals, one would be hard pressed to say that 97% responsiveness supports a conclusion of lack of efficacy.

At the risk of being overly rhetorical, the requirement of typing all animals in determining vaccine efficacy would be impractical. For, MHC-restricted T cell response frequently implies an individual-specific response towards peptides. Moreover, the type of T cell help induced by a peptide vaccine also has to be considered. Illustratively different cytokine profiles produced by T-helper cell lead to different effector functions. As such, it is arguable that a peptide vaccine that is efficacious for a specific individual would not necessarily be efficacious for another individual. As such, one would argue, as the Examiner seems to be doing that for a vaccine to be useful for a target class, all members of the class must be tested. Surely, the Examiner would agree that such a requirement for efficacy would be impractical.

In point of fact, there is a concurrence between the disclosure of Van Lierop et al and that of the captioned application with regard to the influence of MHC polymorphism. In this regard, Applicants direct the Examiner's attention to page 3, lines 1 to 16 of the captioned application, which acknowledges that polymorphism of the protein of the pathogens occurs especially in the protein sections involved in the immune response. Secondly, the application discusses the variability of the host immune response wherein, say, a T-helper cell only recognizes an antigenic peptide in association with MHC. The application further notes that a T-cell response to peptides can therefore be individually different. Applicants also acknowledge that the T-cell factions exhibit very heterogeneous effector mechanisms, which nevertheless as a rule, correlate with MHC restriction (Mosmann et al. 1989). For FMDV in cattle, it was hitherto only possible to demonstrate MHC-II-restricted T-helper functions (Glass et al. 1989; Glass et al. 1990; Glass et al. 1992; Collen et al. 1991).

The teachings of the publications cited by the application – which predate Van Lierop et al's publication of 1995 - were taken into consideration in the development of Applicants' vaccine. In this regard, Applicants direct the Examiner's attention to page 5, lines 11-20 of captioned application describing immunoreactivity of the subject peptides FMDV-specific T lymphocytes. Overall, the application

provides sufficient direction and guidance needed to enable the vaccines, In Wand 8 USPQ 1400 (Fed. Cir. 1988)/Ex parte Forman 230 USPQ 546 (Bd. Pat. App. Int. 1986). Illustratively, the level of skill in the art is such that, given the disclosure of the application, one can determine vaccine efficacy without undue experimentation. The skilled artisan can ascertain efficacy specific immunoreactivity by specific antibody or specific-lymphocyte testing.

Based on the above stated reasoning, Van Lierop et al would not support a rejection for failure to satisfy the enablement or a description requirement of the claimed vaccines.

In view of the foregoing amendment and discussions, Applicants submit that the Examiner is justified in allowing the claims remaining in the application.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE:

IN THE CLAIMS:

Claims 24-27 have been canceled.